

## Refine Search

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| Terms                        | Documents |
|------------------------------|-----------|
| (L1 and (medical with cost)) | 1         |

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Search:

L2






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### Search History

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| <u>L2</u>  | (L1 and (medical with cost)) | 1                | <u>L2</u>                     |
| <u>L1</u>  | 706/12.ccls.                 | 233              | <u>L1</u>                     |

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Search Results - Record(s) 1 through 1 of 1 returned.

☐ 1. Document ID: US 20030018595 A1

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L2: Entry 1 of 1

File: PGPB

Jan 23, 2003

PGPUB-DOCUMENT-NUMBER: 20030018595

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030018595 A1

TITLE: Machine learning method

PUBLICATION-DATE: January 23, 2003

INVENTOR-INFORMATION:

| NAME                  | CITY       | STATE | COUNTRY | RULE-47 |
|-----------------------|------------|-------|---------|---------|
| Chen, Hung-Han        | Watertown  | MA    | US      |         |
| Hunter, Lawrence      | Denver     | CO    | US      |         |
| Poteat, Harry Towsley | Boston     | MA    | US      |         |
| Snow, Kristin Kendall | Somerville | MA    | US      |         |

US-CL-CURRENT: 706/12

|      |       |          |       |        |                |      |           |           |             |        |      |         |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|---------|
| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | RMIC | Draw De |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|---------|

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|                              |           |
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### Search Results -

| Terms  | Documents |
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| L5 and rules and range and threshold and selecting | 7         |

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L6

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result set

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|           |  |      |           |
|-----------|--|------|-----------|
| <u>L6</u> | L5 and rules and range and threshold and selecting | 7    | <u>L6</u> |
| <u>L5</u> | ((medical with cost) and (training with data))     | 107  | <u>L5</u> |
| <u>L4</u> | L3 and rules and range and threshold and selecting | 96   | <u>L4</u> |
| <u>L3</u> | ((medical with cost) and (training data))          | 3011 | <u>L3</u> |
| <u>L2</u> | (L1 and (medical with cost))                       | 1    | <u>L2</u> |
| <u>L1</u> | 706/12.ccls.                                       | 233  | <u>L1</u> |

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☐ 1. Document ID: US 6306087 B1

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L6: Entry 1 of 7

File: USPT

Oct 23, 2001

US-PAT-NO: 6306087

DOCUMENT-IDENTIFIER: US 6306087 B1

TITLE: Computer assisted methods for diagnosing diseases

DATE-ISSUED: October 23, 2001

INVENTOR-INFORMATION:

| NAME                 | CITY         | STATE | ZIP CODE | COUNTRY |
|----------------------|--------------|-------|----------|---------|
| Barnhill; Stephen D. | Savannah     | GA    |          |         |
| Zhang; Zhen          | Mt. Pleasant | SC    |          |         |

US-CL-CURRENT: 600/300; 128/924

|      |       |          |       |        |                |      |           |           |             |        |      |          |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|----------|
| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. D. |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|----------|

☐ 2. Document ID: US 6301571 B1

L6: Entry 2 of 7

File: USPT

Oct 9, 2001

US-PAT-NO: 6301571

DOCUMENT-IDENTIFIER: US 6301571 B1

TITLE: Method for interacting with a test subject with respect to knowledge and functionality

DATE-ISSUED: October 9, 2001

INVENTOR-INFORMATION:

| NAME                | CITY    | STATE | ZIP CODE | COUNTRY |
|---------------------|---------|-------|----------|---------|
| Tatsuoka; Curtis M. | Trenton | NJ    | 08638    |         |

US-CL-CURRENT: 706/45; 434/322, 705/7, 706/50, 715/501.1

|      |       |          |       |        |                |      |           |           |             |        |      |          |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|----------|
| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. D. |
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☐ 3. Document ID: US 6260033 B1

L6: Entry 3 of 7

File: USPT

Jul 10, 2001

US-PAT-NO: 6260033

DOCUMENT-IDENTIFIER: US 6260033 B1

TITLE: Method for remediation based on knowledge and/or functionality

DATE-ISSUED: July 10, 2001

## INVENTOR-INFORMATION:

| NAME                | CITY    | STATE | ZIP CODE | COUNTRY |
|---------------------|---------|-------|----------|---------|
| Tatsuoka; Curtis M. | Trenton | NJ    | 08638    |         |

US-CL-CURRENT: 706/45; 434/322, 705/7, 706/50, 715/501.1

|      |       |          |       |        |                |      |           |           |             |        |      |         |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|---------|
| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Ds |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|---------|

☐ 4. Document ID: US 6248063 B1

L6: Entry 4 of 7

File: USPT

Jun 19, 2001

US-PAT-NO: 6248063

DOCUMENT-IDENTIFIER: US 6248063 B1

TITLE: Computer assisted methods for diagnosing diseases

DATE-ISSUED: June 19, 2001

## INVENTOR-INFORMATION:

| NAME                 | CITY         | STATE | ZIP CODE | COUNTRY |
|----------------------|--------------|-------|----------|---------|
| Barnhill; Stephen D. | Savannah     | GA    |          |         |
| Zhang; Zhen          | Mt. Pleasant | SC    |          |         |

US-CL-CURRENT: 600/300; 128/924, 706/21

|      |       |          |       |        |                |      |           |           |             |        |      |         |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|---------|
| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Ds |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|---------|

☐ 5. Document ID: US 5855011 A

L6: Entry 5 of 7

File: USPT

Dec 29, 1998

US-PAT-NO: 5855011

DOCUMENT-IDENTIFIER: US 5855011 A

TITLE: Method for classifying test subjects in knowledge and functionality states

DATE-ISSUED: December 29, 1998

## INVENTOR-INFORMATION:

| NAME                | CITY    | STATE | ZIP CODE | COUNTRY |
|---------------------|---------|-------|----------|---------|
| Tatsuoka; Curtis M. | Trenton | NJ    | 08638    |         |

US-CL-CURRENT: 706/45; 706/52

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw D |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|--------|
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|--------|

☐ 6. Document ID: US 5799101 A

L6: Entry 6 of 7

File: USPT

Aug 25, 1998

US-PAT-NO: 5799101

DOCUMENT-IDENTIFIER: US 5799101 A

TITLE: Method and apparatus for highly efficient computer aided screening

DATE-ISSUED: August 25, 1998

## INVENTOR-INFORMATION:

| NAME               | CITY     | STATE | ZIP CODE | COUNTRY |
|--------------------|----------|-------|----------|---------|
| Lee; Shih-Jong J.  | Bellevue | WA    |          |         |
| Oh; Seho           | Mukilteo | WA    |          |         |
| Patten; Stanley F. | Issaquah | WA    |          |         |
| Nelson; Alan C.    | Redmond  | WA    |          |         |
| Nelson; Larry A.   | Bellevue | WA    |          |         |

US-CL-CURRENT: 382/133; 128/922, 356/42, 382/134

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw D |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|--------|
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|--------|

☐ 7. Document ID: US 5769074 A

L6: Entry 7 of 7

File: USPT

Jun 23, 1998

US-PAT-NO: 5769074

DOCUMENT-IDENTIFIER: US 5769074 A

**\*\* See image for Certificate of Correction \*\***

TITLE: Computer assisted methods for diagnosing diseases

DATE-ISSUED: June 23, 1998

## INVENTOR-INFORMATION:

| NAME                 | CITY         | STATE | ZIP CODE | COUNTRY |
|----------------------|--------------|-------|----------|---------|
| Barnhill; Stephen D. | Savannah     | GA    |          |         |
| Zhang; Zhen          | Mt. Pleasant | SC    |          |         |

US-CL-CURRENT: 600/300; 128/924

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KIMC | Draw. D |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|---------|
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|---------|

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| L5 and rules and range and threshold and selecting | 7         |

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*DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=NO; OP=OR*

|           |  |      |           |
|-----------|--|------|-----------|
| <u>L7</u> | L6 and neighbors                                   | 0    | <u>L7</u> |
| <u>L6</u> | L5 and rules and range and threshold and selecting | 7    | <u>L6</u> |
| <u>L5</u> | ((medical with cost) and (training with data))     | 107  | <u>L5</u> |
| <u>L4</u> | L3 and rules and range and threshold and selecting | 96   | <u>L4</u> |
| <u>L3</u> | ((medical with cost) and (training data))          | 3011 | <u>L3</u> |
| <u>L2</u> | (L1 and (medical with cost))                       | 1    | <u>L2</u> |
| <u>L1</u> | 706/12.ccls.                                       | 233  | <u>L1</u> |

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**2 A new research challenge: persuasive technology to motivate health aging**
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**14 Technology in medicine: too much too soon?**

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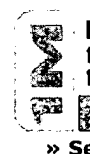
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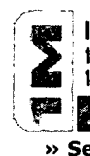
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**1 Expert derived automatically generated classification trees: an examination from pediatric cardiology**

*Bull, C.; Chiogna, M.; Franklin, R.; Spiegelhalter, D.;*  
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*Pinciroli, F.; Antognini, F.;*  
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**3 Hybrid fuzzy logic committee neural networks for classification in medical decision support systems**

*Reddy, N.P.; Rothschild, B.M.;*  
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**4 Neural network models for studying and for managing in real-time schistosomiasis control programs**

*DeClaris, N.; Hammad, T.; Wahab, A.F.; El-Sehly, A.; El-Kady, N.; Strickland,*  
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**5 Investigation of regularized neural networks for the computerized detection of mass lesions in digital mammograms**

*Kupinski, M.A.; Giger, M.L.;*

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**15 PACS in a "digital hospital": preliminary data from phase III evaluation of the experience with filmless operation at the Baltimore VA Medical Center**

*Siegel, E.L.; Pomerantz, S.M.; Protopapas, Z.; Pickar, E.; Diaconis, J.N.; Rein, B.I.; Allman, R.; Shannon, R.;*

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Systems, Man, and Cybernetics, 2000 IEEE International Conference on , Vol. 4 , 8-11 Oct. 2000

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Pages:332 - 337
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Pages:173 - 185
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*Ting, Y.; Lin, S.-D.; Chen, C.H.; Lee, S.S.; Chang, Y.F.;*

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Pages:2932 - 2937 vol.3

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21 **Web-based telerehabilitation for the upper extremity after stroke**

*Reinkensmeyer, D.J.; Pang, C.T.; Nessler, J.A.; Painter, C.C.;*

Neural Systems and Rehabilitation Engineering, IEEE Transactions on [see also IEEE Trans. on Rehabilitation Engineering] , Volume: 10 , Issue: 2 , Jun 2002

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22 **Postprocessing of rule sets induced from a melanoma data set**

*Grzymala-Busse, J.W.; Hippe, Z.S.;*

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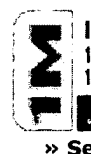
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John Colter, Netscape Navigator

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### 1 [Computing applications III: medical: An analysis of the job market for biomedical computer scientists](#)

Fred R. Sias

 April 1976 **Proceedings of the 14th annual Southeast regional conference**

 Full text available: [pdf\(367.74 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Biomedical Information and Computer Science is an academic area that has received much interest recently. A number of training programs have been developed around the country. This paper is an examination of the potential market for biomedical information and computer scientists. It is possible to identify a number of organizations that may potentially employ biomedical computer scientists. Included in such a list are medical schools, hospitals above a certain size, software houses, health maintenance organizations, and medical equipment manufacturers.

### 2 [Decision trees with minimal costs](#)

Charles X. Ling, Qiang Yang, Jianning Wang, Shichao Zhang

 July 2004 **Twenty-first international conference on Machine learning**

 Full text available: [pdf\(306.59 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

We propose a simple, novel and yet effective method for building and testing decision trees that minimizes the sum of the misclassification and test costs. More specifically, we first put forward an original and simple splitting criterion for attribute selection in tree building. Our tree-building algorithm has many desirable properties for a cost-sensitive learning system that must account for both types of costs. Then, assuming that the test cases may have a large number of missing values, we ...

### 3 [6-2 VRC in simulation & training: Multidimensional volume visualization for PC-based microsurgical simulation system](#)

Zhenlan Wang, Chee-Kong Chui, Yiyu Cai, Chuan-Heng Ang

 June 2004 **Proceedings of the 2004 ACM SIGGRAPH international conference on Virtual Reality continuum and its applications in industry**

 Full text available: [pdf\(446.38 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Microsurgery is a highly complex surgical procedure on small body parts performed by a dedicated surgical team. An operating microscope is typically used to obtain a precise view of the soft tissues. The complexity of the microsurgical procedure makes it a suitable application of virtual/augmented reality technology for training purpose. In this paper, we present an overview of our simulator and then describe the visualization work that reconstructs the magnified view of the operating area from ...

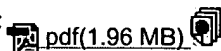
**Keywords:** LLO/DLLO, microsurgery, simulation, visualization, volume rendering

4 Learning methods to combine linguistic indicators: improving aspectual classification and revealing linguistic insights

Eric V. Siegel, Kathleen R. McKeown

December 2000 **Computational Linguistics**, Volume 26 Issue 4

Full text available:



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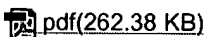
Aspectual classification maps verbs to a small set of primitive categories in order to reason about time. This classification is necessary for interpreting temporal modifiers and assessing temporal relationships, and is therefore a required component for many natural language applications. A verb's aspectual category can be predicted by co-occurrence frequencies between the verb and certain linguistic modifiers. These frequency measures, called linguistic indicators, are chosen by linguistic insi ...

5 Special issue on learning from imbalanced datasets: Minority report in fraud detection: classification of skewed data

Clifton Phua, Daminda Alahakoon, Vincent Lee

June 2004 **ACM SIGKDD Explorations Newsletter**, Volume 6 Issue 1

Full text available:



Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

This paper proposes an innovative fraud detection method, built upon existing fraud detection research and *Minority Report*, to deal with the data mining problem of skewed data distributions. This method uses backpropagation (BP), together with naive Bayesian (NB) and C4.5 algorithms, on data partitions derived from minority oversampling with replacement. Its originality lies in the use of a single meta-classifier (stacking) to choose the best base classifiers, and then combine these base ...

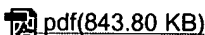
**Keywords:** fraud detection, meta-learning, multiple classifier systems

6 Cost/benefit based adaptive dialog: case study using empirical medical practice norms and intelligent split menus

Jim Warren

January 2001 **Australian Computer Science Communications , Proceedings of the 2nd Australasian conference on User interface**, Volume 23 Issue 5

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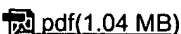
The notion of an adaptive user interface, one that accommodates user needs based on knowledge of the task at hand, is compelling but difficult to make practical. This paper examines models of the utility (as balancing of cost and benefit) in the initiation of task-specific dialog based on conditional probability of user goals in context. Illustrations in this paper are based on an empirical model of General Practice (GP) medicine as derived from a large database of GP/patient encounters. Applica ...

7 Examining alternative End-Stage Renal Disease (ESRD) therapies through simulation

Stephen D. Roberts, Thomas L. Gross, Douglas R. Maxwell

March 1979 **Proceedings of the 12th annual symposium on Simulation**

Full text available:



Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

To examine the costs and effects of alternative treatments for End-Stage Renal Disease

(ESRD), we constructed a simulation model which estimates patient survival and lifetime cost for those with ESRD. The model, written in the INS simulation language, considers home and center hemodialysis as well as live related and cadaver donor transplantation. After the model was validated, the cost per life year gained for each therapy was computed. Center hemodialysis was found to have the poorest cos ...

#### 8 98¢/Mflops/s ultra-large-scale neural-network training on a pIII cluster

Douglas A. Aberdeen, Jonathan Baxter, Robert Edwards

November 2000 **Proceedings of the 2000 ACM/IEEE conference on Supercomputing (CDROM)**

Full text available:  pdf(215.33 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

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Artificial neural networks with millions of adjustable parameters and a similar number of training examples are a potential solution for difficult, large-scale pattern recognition problems in areas such as speech and face recognition, classification of large volumes of web data and finance. The bottleneck is that neural network training involves iterative gradient descent and is extremely computationally intensive. In this paper we present a technique for distributed training of Ultra Large ...

**Keywords:** neural-network, Linux cluster, matrix-multiply

#### 9 May I interrupt?: BusyBody: creating and fielding personalized models of the cost of interruption

Eric Horvitz, Paul Koch, Johnson Apacible

November 2004 **Proceedings of the 2004 ACM conference on Computer supported cooperative work**

Full text available:  pdf(145.02 KB)

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Interest has been growing in opportunities to build and deploy statistical models that can infer a computer user's current interruptability from computer activity and relevant contextual information. We describe a system that intermittently asks users to assess their perceived interruptability during a training phase and that builds decision-theoretic models with the ability to predict the cost of interrupting the user. The models are used at run-time to compute the expected cost of interrupt ...

**Keywords:** cost of interruption, models of attention, notification systems

#### 10 Man-machine communications in the biological-medical research environment

William E. Farley, Alfred H. Pulido, Tate M. Minckler, Lee D. Cady

January 1966 **Proceedings of the 1966 21st national conference**

Full text available:  pdf(297.42 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The key source of raw data in most biomedical research is the patient's medical record. The hospital patient medical record is most commonly thought of as the repository for all pertinent facts relating to laboratory test results, diagnostic conclusions, treatment procedures, and observations. Depending on the nature of the patient's complaint, there are varying amounts of medical history information incorporated into the record. In many instances, the compilation of the record has become s ...

#### 11 On becoming virtual: the driving forces and arrangements

Magid Igbaria, Conrad Shayo, Lorne Olfman

April 1999 **Proceedings of the 1999 ACM SIGCPR conference on Computer personnel research**

Full text available:  pdf(1.80 MB)Additional Information: [full citation](#), [references](#), [index terms](#)

**Keywords:** telework, virtual communities, virtual organizations, virtual society, virtual teams

12 Special issue on learning from imbalanced datasets: Mining with rarity: a unifying framework

Gary M. Weiss

June 2004 **ACM SIGKDD Explorations Newsletter**, Volume 6 Issue 1Full text available:  pdf(182.31 KB)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Rare objects are often of great interest and great value. Until recently, however, rarity has not received much attention in the context of data mining. Now, as increasingly complex real-world problems are addressed, rarity, and the related problem of imbalanced data, are taking center stage. This article discusses the role that rare classes and rare cases play in data mining. The problems that can result from these two forms of rarity are described in detail, as are methods for addressing these ...

**Keywords:** class imbalance, cost-sensitive learning, inductive bias, rare cases, rare classes, sampling, small disjuncts

13 Turmoil at NASA, and numerous funding announcements

Xiaolei Qian

September 1995 **ACM SIGMOD Record**, Volume 24 Issue 3Full text available:  pdf(115.95 KB)Additional Information: [full citation](#), [abstract](#), [index terms](#)

Since the last issue of this column six months ago, there have been many interesting program announcements, some of which have already passed deadline. We'll go over these announcements anyway, with the hope that they can get the readers better prepared for future funding opportunities. But first, we'll talk about the continuing budget battle at Congress, and the recent turmoil at NASA.


14 Computer aides to medical diagnosis—problems and progress

Stephen R. Yarnall, Richard A. Kronmal

July 1966 **Communications of the ACM**, Volume 9 Issue 7Full text available:  pdf(654.43 KB)Additional Information: [full citation](#)

15 Man/machine communications in the biological medical research environment

W. E. Farley, A. H. Pulido, T. M. Minckler, L. D. Cady

July 1966 **Communications of the ACM**, Volume 9 Issue 7Full text available:  pdf(654.43 KB)Additional Information: [full citation](#)

16 Engineering, medical and scientific applications

G. H. Kuby

July 1966 **Communications of the ACM**, Volume 9 Issue 7


Full text available:

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17 META5: A tool to manipulate strings of data

David K. Oppenheim, Dan P. Haggerty

July 1966 **Communications of the ACM**, Volume 9 Issue 7


Full text available:  [pdf\(654.43 KB\)](#) Additional Information: [full citation](#)



18 A real-time error correcting data transmission system treated as a Markov process

Frank T. Kuhn

July 1966 **Communications of the ACM**, Volume 9 Issue 7


Full text available:  [pdf\(654.43 KB\)](#) Additional Information: [full citation](#)



19 Lunar orbiter command and telemetry data handling system (CTDH) at deep space stations

I. Holgersen, E. Knutson, D. R. Merrill

July 1966 **Communications of the ACM**, Volume 9 Issue 7


Full text available:  [pdf\(654.43 KB\)](#) Additional Information: [full citation](#)



20 A special purpose multiprogramming system for a computer-controlled telemetry data reduction system

Harold R. Gillette

July 1966 **Communications of the ACM**, Volume 9 Issue 7

Full text available:  [pdf\(654.43 KB\)](#) Additional Information: [full citation](#)



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# 1 [Special issue on learning from imbalanced datasets: A study of the behavior of several methods for balancing machine learning training data](#)

Gustavo E. A. P. A. Batista, Ronaldo C. Prati, Maria Carolina Monard

June 2004 **ACM SIGKDD Explorations Newsletter**, Volume 6 Issue 1Full text available: [pdf\(314.77 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

There are several aspects that might influence the performance achieved by existing learning systems. It has been reported that one of these aspects is related to class imbalance in which examples in training data belonging to one class heavily outnumber the examples in the other class. In this situation, which is found in real world data describing an infrequent but important event, the learning system may have difficulties to learn the concept related to the minority class. In this work we per ...

# 2 [Cost/benefit based adaptive dialog: case study using empirical medical practice norms and intelligent split menus](#)

Jim Warren

January 2001 **Australian Computer Science Communications , Proceedings of the 2nd Australasian conference on User interface**, Volume 23 Issue 5Full text available: [pdf\(843.80 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)
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The notion of an adaptive user interface, one that accommodates user needs based on knowledge of the task at hand, is compelling but difficult to make practical. This paper examines models of the utility (as balancing of cost and benefit) in the initiation of task-specific dialog based on conditional probability of user goals in context. Illustrations in this paper are based on an empirical model of General Practice (GP) medicine as derived from a large database of GP/patient encounters. Applica ...

# 3 [Special section on data mining for intrusion detection and threat analysis: Data mining-based intrusion detectors: an overview of the columbia IDS project](#)

Salvatore J. Stolfo, Wenke Lee, Philip K. Chan, Wei Fan, Eleazar Eskin

December 2001 **ACM SIGMOD Record**, Volume 30 Issue 4Full text available: [pdf\(1.05 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

# 4 [Special issue on learning from imbalanced datasets: Minority report in fraud detection:](#)

classification of skewed data

Clifton Phua, Daminda Alahakoon, Vincent Lee

June 2004 **ACM SIGKDD Explorations Newsletter**, Volume 6 Issue 1Full text available:  [pdf\(262.38 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

This paper proposes an innovative fraud detection method, built upon existing fraud detection research and *Minority Report*, to deal with the data mining problem of skewed data distributions. This method uses backpropagation (BP), together with naive Bayesian (NB) and C4.5 algorithms, on data partitions derived from minority oversampling with replacement. Its originality lies in the use of a single meta-classifier (stacking) to choose the best base classifiers, and then combine these base ...

**Keywords:** fraud detection, meta-learning, multiple classifier systems**5** Image and video digital libraries: Semantic video classification and feature subset selection under context and concept uncertainty

Jianping Fan, Hangzai Luo, Jing Xiao, Lide Wu

June 2004

Full text available:  [pdf\(258.04 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

As large collections of videos become one key component of digital libraries, there is an urgent need of semantic video classification and feature subset selection to enable more effective video database organization and retrieval. However, most existing techniques for classifier training require a large number of labeled samples to learn correctly and suffer from the problems of context and concept uncertainty when only a limited number of labeled samples are available. To address the problems ...

**Keywords:** adaptive EM algorithm, context and concept uncertainty, semantic video classification, unlabeled samples**6** A Bayesian decision model for cost optimal record matching

V. S. Verykios, G. V. Moustakides, M. G. Elfeky

May 2003 **The VLDB Journal — The International Journal on Very Large Data Bases**, Volume 12 Issue 1Full text available:  [pdf\(180.87 KB\)](#) Additional Information: [full citation](#), [abstract](#), [index terms](#)

In an error-free system with perfectly clean data, the construction of a global view of the data consists of linking - in relational terms, joining - two or more tables on their key fields. Unfortunately, most of the time, these data are neither carefully controlled for quality nor necessarily defined commonly across different data sources. As a result, the creation of such a global data view resorts to approximate joins. In this paper, an optimal solution is proposed for the matching or the lin ...

**Keywords:** Cost optimal statistical model, Data cleaning, Record linkage**7** Rule-based machine learning of spatial data concepts

Steve Stearns, Daniel C. St. Clair

February 1995 **Proceedings of the 1995 ACM symposium on Applied computing**Full text available:  [pdf\(730.02 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)**Keywords:** AQ15, classification, expert systems, geographic information systems, machine learning



8 Special issue on learning from imbalanced datasets: Mining with rarity: a unifying framework

Gary M. Weiss

June 2004 **ACM SIGKDD Explorations Newsletter**, Volume 6 Issue 1

Full text available:  [pdf\(182.31 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Rare objects are often of great interest and great value. Until recently, however, rarity has not received much attention in the context of data mining. Now, as increasingly complex real-world problems are addressed, rarity, and the related problem of imbalanced data, are taking center stage. This article discusses the role that rare classes and rare cases play in data mining. The problems that can result from these two forms of rarity are described in detail, as are methods for addressing these ...

**Keywords:** class imbalance, cost-sensitive learning, inductive bias, rare cases, rare classes, sampling, small disjuncts

9 Data transformation and duplicate detection: A generalized cost optimal decision model for record matching

Vassilios S. Verykios, George V. Moustakides

June 2004 **Proceedings of the 2004 international workshop on Information quality in information systems**

Full text available:  [pdf\(118.81 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)


Record (or entity) matching or linkage is the process of identifying records in one or more data sources, that refer to the same real world entity or object. In record linkage, the ultimate goal of a decision model is to provide the decision maker with a tool for making decisions upon the actual matching status of a pair of records (i.e., documents, events, persons, cases, etc.). Existing models of record linkage rely on decision rules that minimize the probability of subjecting a case to clerical ...

**Keywords:** probabilistic decision model, record matching

10 Special issue on the fusion of domain knowledge with data for decision support: Preference elicitation via theory refinement

Peter Haddawy, Vu Ha, Angelo Restificar, Benjamin Geisler, John Miyamoto

December 2003 **The Journal of Machine Learning Research**, Volume 4


Full text available:  [pdf\(150.88 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We present an approach to elicitation of user preference models in which assumptions can be used to guide but not constrain the elicitation process. We demonstrate that when domain knowledge is available, even in the form of weak and somewhat inaccurate assumptions, significantly less data is required to build an accurate model of user preferences than when no domain knowledge is provided. This approach is based on the KBANN (Knowledge-Based Artificial Neural Network) algorithm pioneered by Shav ...

11 Automated learning of decision rules for text categorization

Chidanand Apté, Fred Damerau, Sholom M. Weiss

July 1994 **ACM Transactions on Information Systems (TOIS)**, Volume 12 Issue 3

Full text available:  [pdf\(1.28 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

We describe the results of extensive experiments using optimized rule-based induction methods on large document collections. The goal of these methods is to discover automatically classification patterns that can be used for general document categorization or personalized filtering of free text. Previous reports indicate that human-engineered rule-based systems, requiring many man-years of developmental efforts, have been successfully built to "read" documents and assign topics ...

**12** A hierarchical access control model for video database systems

Elisa Bertino, Jianping Fan, Elena Ferrari, Mohand-Said Hacid, Ahmed K. Elmagarmid, Xingquan Zhu

April 2003 **ACM Transactions on Information Systems (TOIS)**, Volume 21 Issue 2

Full text available:  pdf(6.27 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Content-based video database access control is becoming very important, but it depends on the progresses of the following related research issues: (a) efficient video analysis for supporting semantic visual concept representation; (b) effective video database indexing structure; (c) the development of suitable video database models; and (d) the development of access control models tailored to the characteristics of video data. In this paper, we propose a novel approach to support multilevel access ...

**Keywords:** Video database models, access control, indexing schemes

**13** QProber: A system for automatic classification of hidden-Web databases

Luis Gravano, Panagiotis G. Ipeirotis, Mehran Sahami

January 2003 **ACM Transactions on Information Systems (TOIS)**, Volume 21 Issue 1

Full text available:  pdf(3.62 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The contents of many valuable Web-accessible databases are only available through search interfaces and are hence invisible to traditional Web "crawlers." Recently, commercial Web sites have started to manually organize Web-accessible databases into Yahoo!-like hierarchical classification schemes. Here we introduce QProber, a modular system that automates this classification process by using a small number of query probes, generated by document classifiers. QProber can use a variety of types of ...

**Keywords:** Database classification, Web databases, hidden Web

**14** A review of vessel extraction techniques and algorithms

Cemil Kirbas, Francis Quek

June 2004 **ACM Computing Surveys (CSUR)**, Volume 36 Issue 2

Full text available:  pdf(8.06 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Vessel segmentation algorithms are the critical components of circulatory blood vessel analysis systems. We present a survey of vessel extraction techniques and algorithms. We put the various vessel extraction approaches and techniques in perspective by means of a classification of the existing research. While we have mainly targeted the extraction of blood vessels, neurovascular structure in particular, we have also reviewed some of the segmentation methods for the tubular objects that show ...

**Keywords:** Magnetic resonance angiography, X-ray angiography, medical imaging, neurovascular, vessel extraction

**15** Improving SVM accuracy by training on auxiliary data sources


Pengcheng Wu, Thomas G. Dietterich

**July 2004 Twenty-first international conference on Machine learning**Full text available:  [pdf\(263.65 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

The standard model of supervised learning assumes that training and test data are drawn from the same underlying distribution. This paper explores an application in which a second, auxiliary, source of data is available drawn from a different distribution. This auxiliary data is more plentiful, but of significantly lower quality, than the training and test data. In the SVM framework, a training example has two roles: (a) as a data point to constrain the learning process and (b) as a candidate su ...

**16 Applications of machine learning and rule induction**

Pat Langley, Herbert A. Simon

November 1995 **Communications of the ACM**, Volume 38 Issue 11Full text available:  [pdf\(554.28 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Machine learning is the study of computational methods for improving performance by mechanizing the acquisition of knowledge from experience. Expert performance requires much domain-specific knowledge, and knowledge engineering has produced hundreds of AI expert systems that are now used regularly in industry. Machine learning aims to provide increasing levels of automation in the knowledge engineering process, replacing much time-consuming human activity with automatic tec ...

**17 Industrial/government track: Clinical and financial outcomes analysis with existing hospital patient records**


R. Bharat Rao, Sathyakama Sandilya, Radu Stefan Niculescu, Colin Germond, Harsha Rao

August 2003 **Proceedings of the ninth ACM SIGKDD international conference on Knowledge discovery and data mining**Full text available:  [pdf\(188.40 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Existing patient records are a valuable resource for automated outcomes analysis and knowledge discovery. However, key clinical data in these records is typically recorded in unstructured form as free text and images, and most structured clinical information is poorly organized. Time-consuming interpretation and analysis is required to convert these records into structured clinical data. Thus, only a tiny fraction of this resource is utilized. We present REMIND, a Bayesian Framework for Reliable ...

**Keywords:** Bayes Nets, HMMs, data mining, temporal reasoning**18 Fuzzy rule extraction from GIS data with a neural fuzzy system for decision making**

Ding Zheng, Wolfgang Kainz

November 1999 **Proceedings of the 7th ACM international symposium on Advances in geographic information systems**Full text available:  [pdf\(1.07 MB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)**Keywords:** GIS, decision-making, fuzzy rule inference, neural network**19 Privacy of medical records: IT implications of HIPAA**

David Baumer, Julia Brande Earp, Fay Cobb Payton

December 2000 **ACM SIGCAS Computers and Society**, Volume 30 Issue 4Full text available:  [pdf\(819.71 KB\)](#) Additional Information: [full citation](#), [abstract](#)

Increasingly, medical records are being stored in computer databases that allow for

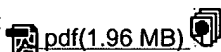
efficiencies in providing treatment and in the processing of clinical and financial services. Computerization of medical records has also diminished patient privacy and, in particular, has increased the potential for misuse, especially in the form of nonconsensual secondary use of personally identifiable records. Organizations that store and use medical records have had to establish security measures, prompted pa ...

**20 Learning methods to combine linguistic indicators: improving aspectual classification and revealing linguistic insights**

Eric V. Siegel, Kathleen R. McKeown

December 2000 **Computational Linguistics**, Volume 26 Issue 4

Full text available:



Additional Information: [full citation](#), [abstract](#), [references](#)

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Aspectual classification maps verbs to a small set of primitive categories in order to reason about time. This classification is necessary for interpreting temporal modifiers and assessing temporal relationships, and is therefore a required component for many natural language applications. A verb's aspectual category can be predicted by co-occurrence frequencies between the verb and certain linguistic modifiers. These frequency measures, called linguistic indicators, are chosen by linguistic insi ...

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John Colter, Netscape Navigator

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### 1 [Data clustering: a review](#)

A. K. Jain, M. N. Murty, P. J. Flynn

September 1999 **ACM Computing Surveys (CSUR)**, Volume 31 Issue 3

Full text available: [pdf\(636.24 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Clustering is the unsupervised classification of patterns (observations, data items, or feature vectors) into groups (clusters). The clustering problem has been addressed in many contexts and by researchers in many disciplines; this reflects its broad appeal and usefulness as one of the steps in exploratory data analysis. However, clustering is a difficult problem combinatorially, and differences in assumptions and contexts in different communities has made the transfer of useful generic co ...

**Keywords:** cluster analysis, clustering applications, exploratory data analysis, incremental clustering, similarity indices, unsupervised learning

### 2 [A review of vessel extraction techniques and algorithms](#)

Cemil Kirbas, Francis Quek

June 2004 **ACM Computing Surveys (CSUR)**, Volume 36 Issue 2

Full text available: [pdf\(8.06 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

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**Keywords:** Magnetic resonance angiography, X-ray angiography, medical imaging, neurovascular, vessel extraction

### 3 [Computational strategies for object recognition](#)

Paul Suetens, Pascal Fua, Andrew J. Hanson

March 1992 **ACM Computing Surveys (CSUR)**, Volume 24 Issue 1

Additional Information:

Full text available:  [pdf\(6.37 MB\)](#)

[full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

This article reviews the available methods for automated identification of objects in digital images. The techniques are classified into groups according to the nature of the computational strategy used. Four classes are proposed: (1) the simplest strategies, which work on data appropriate for feature vector classification, (2) methods that match models to symbolic data structures for situations involving reliable data and complex models, (3) approaches that fit models to the photometry and ...

**Keywords:** image understanding, model-based vision, object recognition

#### 4 [Machine learning in automated text categorization](#)

Fabrizio Sebastiani

March 2002 **ACM Computing Surveys (CSUR)**, Volume 34 Issue 1

Full text available:  [pdf\(524.41 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The automated categorization (or classification) of texts into predefined categories has witnessed a booming interest in the last 10 years, due to the increased availability of documents in digital form and the ensuing need to organize them. In the research community the dominant approach to this problem is based on machine learning techniques: a general inductive process automatically builds a classifier by learning, from a set of preclassified documents, the characteristics of the categories. ...

**Keywords:** Machine learning, text categorization, text classification

#### 5 [A hierarchical access control model for video database systems](#)

Elisa Bertino, Jianping Fan, Elena Ferrari, Mohand-Said Hacid, Ahmed K. Elmagarmid, Xingquan Zhu

April 2003 **ACM Transactions on Information Systems (TOIS)**, Volume 21 Issue 2

Full text available:  [pdf\(6.27 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

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**Keywords:** Video database models, access control, indexing schemes

#### 6 [Rule-based machine learning of spatial data concepts](#)

Steve Stearns, Daniel C. St. Clair

February 1995 **Proceedings of the 1995 ACM symposium on Applied computing**

Full text available:  [pdf\(730.02 KB\)](#)

Additional Information: [full citation](#), [references](#), [index terms](#)

**Keywords:** AQ15, classification, expert systems, geographic information systems, machine learning

#### 7 [Automated learning of decision rules for text categorization](#)



Chidanand Apté, Fred Damerau, Sholom M. Weiss

July 1994 **ACM Transactions on Information Systems (TOIS)**, Volume 12 Issue 3

Full text available:  pdf(1.28 MB)


Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

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## 8 Model-based recognition in robot vision

Roland T. Chin, Charles R. Dyer

March 1986 **ACM Computing Surveys (CSUR)**, Volume 18 Issue 1

Full text available:  pdf(4.94 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

This paper presents a comparative study and survey of model-based object-recognition algorithms for robot vision. The goal of these algorithms is to recognize the identity, position, and orientation of randomly oriented industrial parts. In one form this is commonly referred to as the "bin-picking" problem, in which the parts to be recognized are presented in a jumbled bin. The paper is organized according to 2-D, 2½-D, and 3-D object representations, which are used as the basis for ...

## 9 Computing curricula 2001

September 2001 **Journal on Educational Resources in Computing (JERIC)**

Full text available:  pdf(613.63 KB)  
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Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

## 10 An efficient boosting algorithm for combining preferences

Yoav Freund, Raj Iyer, Robert E. Schapire, Yoram Singer

December 2003 **The Journal of Machine Learning Research**, Volume 4

Full text available:  pdf(392.20 KB)

Additional Information: [full citation](#), [abstract](#), [index terms](#)

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July 2004 **Twenty-first international conference on Machine learning**

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12 Poster papers: Tumor cell identification using features rules

Bin Fang, Wynne Hsu, Mong Li Lee

July 2002 **Proceedings of the eighth ACM SIGKDD international conference on Knowledge discovery and data mining**

Full text available:  pdf(152.89 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Advances in imaging techniques have led to large repositories of images. There is an increasing demand for automated systems that can analyze complex medical images and extract meaningful information for mining patterns. Here, we describe a real-life image mining application to the problem of tumour cell counting. The quantitative analysis of tumour cells is fundamental to characterizing the activity of tumour cells. Existing approaches are mostly manual, time-consuming and subjective. Efforts t ...

**Keywords:** dynamic water immersion, features rules, identification, local adaptive thresholding, majority vote, meta classifier, weighted vote

13 Trading MIPS and memory for knowledge engineering

Robert H. Creecy, Brij M. Masand, Stephen J. Smith, David L. Waltz

August 1992 **Communications of the ACM**, Volume 35 Issue 8

Full text available:  pdf(7.46 MB)


Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#), [review](#)

**Keywords:** automated system building, case-based reasoning, empirical learning, memory-based reasoning, textual database classification

14 Three-dimensional medical imaging: algorithms and computer systems

M. R. Stytz, G. Frieder, O. Frieder

December 1991 **ACM Computing Surveys (CSUR)**, Volume 23 Issue 4

Full text available:  pdf(7.38 MB)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#), [review](#)

**Keywords:** Computer graphics, medical imaging, surface rendering, three-dimensional imaging, volume rendering

15 Face recognition: A literature survey

W. Zhao, R. Chellappa, P. J. Phillips, A. Rosenfeld

December 2003 **ACM Computing Surveys (CSUR)**, Volume 35 Issue 4

Full text available:  pdf(4.28 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

As one of the most successful applications of image analysis and understanding, face recognition has recently received significant attention, especially during the past several years. At least two reasons account for this trend: the first is the wide range of commercial and law enforcement applications, and the second is the availability of feasible technologies after 30 years of research. Even though current machine recognition systems have reached a certain level of maturity, their success is ...

**Keywords:** Face recognition, person identification

16 A survey on wavelet applications in data mining

Tao Li, Qi Li, Shenghuo Zhu, Mitsunori Ogihara

December 2002 **ACM SIGKDD Explorations Newsletter**, Volume 4 Issue 2

Full text available:  pdf(330.06 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Recently there has been significant development in the use of wavelet methods in various data mining processes. However, there has been written no comprehensive survey available on the topic. The goal of this is paper to fill the void. First, the paper presents a high-level data-mining framework that reduces the overall process into smaller components. Then applications of wavelets for each component are reviewed. The paper concludes by discussing the impact of wavelets on data mining research an ...

### 17 Model selection via the AUC

Saharon Rosset

July 2004 **Twenty-first international conference on Machine learning**

Full text available:  pdf(237.64 KB) Additional Information: [full citation](#), [abstract](#), [references](#)

We present a statistical analysis of the AUC as an evaluation criterion for classification scoring models. First, we consider significance tests for the difference between AUC scores of two algorithms on the same test set. We derive exact moments under simplifying assumptions and use them to examine approximate practical methods from the literature. We then compare AUC to empirical misclassification error when the prediction goal is to *minimize future error rate*. We show that the AUC may ...

### 18 Applications of machine learning and rule induction

Pat Langley, Herbert A. Simon


November 1995 **Communications of the ACM**, Volume 38 Issue 11

Full text available:  pdf(554.28 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

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### 19 Theory of keyblock-based image retrieval

April 2002 **ACM Transactions on Information Systems (TOIS)**, Volume 20 Issue 2

Full text available:  pdf(2.14 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#), [review](#)

The success of text-based retrieval motivates us to investigate analogous techniques which can support the querying and browsing of image data. However, images differ significantly from text both syntactically and semantically in their mode of representing and expressing information. Thus, the generalization of information retrieval from the text domain to the image domain is non-trivial. This paper presents a framework for information retrieval in the image domain which supports content-based q ...


**Keywords:** clustering, codebook, content-based image retrieval, keyblock

### 20 Hierarchical classification of Web content

Susan Dumais, Hao Chen

July 2000 **Proceedings of the 23rd annual international ACM SIGIR conference on Research and development in information retrieval**

Full text available: Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index](#)

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This paper explores the use of hierarchical structure for classifying a large, heterogeneous collection of web content. The hierarchical structure is initially used to train different second-level classifiers. In the hierarchical case, a model is learned to distinguish a second-level category from other categories within the same top level. In the flat non-hierarchical case, a model distinguishes a second-level category from all other second-level categories. Scoring rules can further take ad ...

**Keywords:** Web hierarchies, classification, hierarchical models, machine learning, support vector machines, text categorization, text classification

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Fabrizio Sebastiani

March 2002 **ACM Computing Surveys (CSUR)**, Volume 34 Issue 1

Full text available: [pdf\(524.41 KB\)](#)

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September 2001 **Journal on Educational Resources in Computing (JERIC)**

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W. Zhao, R. Chellappa, P. J. Phillips, A. Rosenfeld

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##### 7 The Hearsay-II Speech-Understanding System: Integrating Knowledge to Resolve Uncertainty

Lee D. Erman, Frederick Hayes-Roth, Victor R. Lesser, D. Raj Reddy

June 1980 **ACM Computing Surveys (CSUR)**, Volume 12 Issue 2

Full text available:  pdf(3.83 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

##### 8 Data clustering: a review

A. K. Jain, M. N. Murty, P. J. Flynn

September 1999 **ACM Computing Surveys (CSUR)**, Volume 31 Issue 3

Full text available:  pdf(636.24 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

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problem combinatorially, and differences in assumptions and contexts in different communities has made the transfer of useful generic co ...

**Keywords:** cluster analysis, clustering applications, exploratory data analysis, incremental clustering, similarity indices, unsupervised learning

9 Fast detection of communication patterns in distributed executions

Thomas Kunz, Michiel F. H. Seuren

November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research**

Full text available:  pdf(4.21 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

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11 A review of vessel extraction techniques and algorithms

Cemil Kirbas, Francis Quek

June 2004 **ACM Computing Surveys (CSUR)**, Volume 36 Issue 2

Full text available:  pdf(8.06 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


Vessel segmentation algorithms are the critical components of circulatory blood vessel analysis systems. We present a survey of vessel extraction techniques and algorithms. We put the various vessel extraction approaches and techniques in perspective by means of a classification of the existing research. While we have mainly targeted the extraction of blood vessels, neurovascular structure in particular, we have also reviewed some of the segmentation methods for the tubular objects that show ...

**Keywords:** Magnetic resonance angiography, X-ray angiography, medical imaging, neurovascular, vessel extraction

12 Computational strategies for object recognition

Paul Suetens, Pascal Fua, Andrew J. Hanson

March 1992 **ACM Computing Surveys (CSUR)**, Volume 24 Issue 1

Full text available:  pdf(6.37 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

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computational strategy used. Four classes are proposed: (1) the simplest strategies, which work on data appropriate for feature vector classification, (2) methods that match models to symbolic data structures for situations involving reliable data and complex models, (3) approaches that fit models to the photometry and ...

**Keywords:** image understanding, model-based vision, object recognition

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Donna K. Slonim, Pablo Tamayo, Jill P. Mesirov, Todd R. Golub, Eric S. Lander  
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Sašo Džeroski  
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Sylvain Petitjean

June 2002 **ACM Computing Surveys (CSUR)**, Volume 34 Issue 2

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**Keywords:** Data fitting, geometry enhancement, local geometry estimation, mesh fairing, shape recovery

19 Fuzzy measures in inductive reasoning

DongHui Li, François E. Cellier

December 1990 **Proceedings of the 22nd conference on Winter simulation**

Full text available:  pdf(1.31 MB)

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20 Evaluating collaborative filtering recommender systems

Jonathan L. Herlocker, Joseph A. Konstan, Loren G. Terveen, John T. Riedl

January 2004 **ACM Transactions on Information Systems (TOIS)**, Volume 22 Issue 1

Full text available:  pdf(253.92 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Recommender systems have been evaluated in many, often incomparable, ways. In this article, we review the key decisions in evaluating collaborative filtering recommender systems: the user tasks being evaluated, the types of analysis and datasets being used, the ways in which prediction quality is measured, the evaluation of prediction attributes other than quality, and the user-based evaluation of the system as a whole. In addition to reviewing the evaluation strategies used by prior researchers ...

**Keywords:** Collaborative filtering, evaluation, metrics, recommender systems

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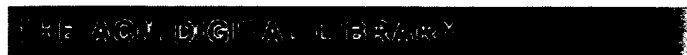


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Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

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**Keywords:** efficiency trade-offs, soundness/completeness/expressibility

### 13 Model selection via the AUC

Saharon Rosset

July 2004 **Twenty-first international conference on Machine learning**


Full text available:  [pdf\(237.64 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

We present a statistical analysis of the AUC as an evaluation criterion for classification scoring models. First, we consider significance tests for the difference between AUC scores of two algorithms on the same test set. We derive exact moments under simplifying assumptions and use them to examine approximate practical methods from the literature. We then compare AUC to empirical misclassification error when the prediction goal is to *minimize future error rate*. We show that the AUC may ...

### 14 A survey of methods for recovering quadrics in triangle meshes

Sylvain Petitjean

June 2002 **ACM Computing Surveys (CSUR)**, Volume 34 Issue 2

Full text available:  [pdf\(3.91 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


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Donna K. Slonim, Pablo Tamayo, Jill P. Mesirov, Todd R. Golub, Eric S. Lander

April 2000 **Proceedings of the fourth annual international conference on Computational molecular biology**


Full text available:  [pdf\(858.00 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Classification of patient samples is a crucial aspect of cancer diagnosis and treatment. We present a method for classifying samples by computational analysis of gene expression data. We consider the classification problem in two parts: *class discovery* and *class prediction*. Class discovery refers to the process of dividing samples into reproducible classes that have similar behavior or properties, while class prediction places new samples into already known classes. We describe ...

### 16 Tissue classification with gene expression profiles

Amir Ben-Dor, Laurakay Bruhn, Nir Friedman, Iftach Nachman, Michèl Schummer, Zohar Yakhini

April 2000 **Proceedings of the fourth annual international conference on Computational molecular biology**

Full text available:  [pdf\(1.11 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Constantly improving gene expression profiling technologies are expected to provide understanding and insight into cancer related cellular processes. Gene expression data is also expected to significantly aid in the development of efficient cancer diagnosis and classification platforms. In this work we examine two sets of gene expression data measured across sets of tumor and normal clinical samples. One set consists of 2,000 genes, measured in 62 epithelial colon samples [1]. The second consists of ...

#### 17 Fuzzy measures in inductive reasoning

DongHui Li, François E. Cellier

December 1990 **Proceedings of the 22nd conference on Winter simulation**

Full text available:  pdf(1.31 MB)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)



#### 18 Evaluating collaborative filtering recommender systems

Jonathan L. Herlocker, Joseph A. Konstan, Loren G. Terveen, John T. Riedl

January 2004 **ACM Transactions on Information Systems (TOIS)**, Volume 22 Issue 1

Full text available:  pdf(253.92 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)



Recommender systems have been evaluated in many, often incomparable, ways. In this article, we review the key decisions in evaluating collaborative filtering recommender systems: the user tasks being evaluated, the types of analysis and datasets being used, the ways in which prediction quality is measured, the evaluation of prediction attributes other than quality, and the user-based evaluation of the system as a whole. In addition to reviewing the evaluation strategies used by prior researchers ...

**Keywords:** Collaborative filtering, evaluation, metrics, recommender systems

#### 19 Discovering models of software processes from event-based data

Jonathan E. Cook, Alexander L. Wolf

July 1998 **ACM Transactions on Software Engineering and Methodology (TOSEM)**, Volume 7 Issue 3

Full text available:  pdf(369.76 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)



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**Keywords:** Balboa, process discovery, software process, tools

#### 20 Octrees for faster isosurface generation

Jane Wilhelms, Allen Van Gelder

July 1992 **ACM Transactions on Graphics (TOG)**, Volume 11 Issue 3

Full text available:  pdf(5.16 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)



The large size of many volume data sets often prevents visualization algorithms from providing interactive rendering. The use of hierarchical data structures can ameliorate this problem by storing summary information to prevent useless exploration of regions of little or no current interest within the volume. This paper discusses research into the use of the octree hierarchical data structure when the regions of current interest can vary during the

applicat ...

**Keywords:** hierarchical spatial enumeration, isosurface extraction, octree, scientific visualization

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September 2001 **Journal on Educational Resources in Computing (JERIC)**

Full text available: [pdf\(613.63 KB\)](#) [html\(2.78 KB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

### 2 [Face recognition: A literature survey](#)

W. Zhao, R. Chellappa, P. J. Phillips, A. Rosenfeld

December 2003 **ACM Computing Surveys (CSUR)**, Volume 35 Issue 4

Full text available: [pdf\(4.28 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

As one of the most successful applications of image analysis and understanding, face recognition has recently received significant attention, especially during the past several years. At least two reasons account for this trend: the first is the wide range of commercial and law enforcement applications, the second is the availability of feasible technologies after 30 years of research. Even though current machine recognition systems have reached a certain level of maturity, their success is ...

**Keywords:** Face recognition, person identification

### 3 [Machine learning in automated text categorization](#)

Fabrizio Sebastiani

March 2002 **ACM Computing Surveys (CSUR)**, Volume 34 Issue 1

Full text available: [pdf\(524.41 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


The automated categorization (or classification) of texts into predefined categories has witnessed a booming interest in the last 10 years, due to the increased availability of documents in digital form and the ensuing need to organize them. In the research community the dominant approach to this problem is based on machine learning techniques: a general inductive process automatically builds a classification model, from a set of preclassified documents, the characteristics of the categories. ...

**Keywords:** Machine learning, text categorization, text classification

### 4 [Fast detection of communication patterns in distributed executions](#)

Thomas Kunz, Michiel F. H. Seuren

November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research**

Full text available:  [pdf\(4.21 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Understanding distributed applications is a tedious and difficult task. Visualizations based on process time diagrams are often used to obtain a better understanding of the execution of the application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our experience, such tools display repeated occurrences of non-trivial commun ...

5 An efficient boosting algorithm for combining preferences

Yoav Freund, Raj Iyer, Robert E. Schapire, Yoram Singer

December 2003 **The Journal of Machine Learning Research**, Volume 4

Full text available:  [pdf\(392.20 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [index terms](#)

We study the problem of learning to accurately rank a set of objects by combining a given collection of ranking or preference functions. This problem of combining preferences arises in several applications such as that of combining the results of different search engines, or the "collaborative-filtering" problem of ranking movies for a user based on the movie rankings provided by other users. In this work, we begin by presenting a formal framework for this general problem. We then describe and ...

6 The Hearsay-II Speech-Understanding System: Integrating Knowledge to Resolve Uncertainty

Lee D. Erman, Frederick Hayes-Roth, Victor R. Lesser, D. Raj Reddy

June 1980 **ACM Computing Surveys (CSUR)**, Volume 12 Issue 2

Full text available:  [pdf\(3.83 MB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

7 Trading MIPS and memory for knowledge engineering

Robert H. Creedy, Brij M. Masand, Stephen J. Smith, David L. Waltz

August 1992 **Communications of the ACM**, Volume 35 Issue 8

Full text available:  [pdf\(7.46 MB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#), [review](#)

**Keywords:** automated system building, case-based reasoning, empirical learning, memory-based reasoning, textual database classification

8 Applications of machine learning and rule induction

Pat Langley, Herbert A. Simon

November 1995 **Communications of the ACM**, Volume 38 Issue 11

Full text available:  [pdf\(554.28 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#),

Machine learning is the study of computational methods for improving performance by mechanizing acquisition of knowledge from experience. Expert performance requires much domain-specific knowledge, and knowledge engineering has produced hundreds of AI expert systems that are now regularly in industry. Machine learning aims to provide increasing levels of automation in the knowledge engineering process, replacing much time-consuming human activity with automatic tec ...

9 A survey of image registration techniques

Lisa Gottesfeld Brown

December 1992 **ACM Computing Surveys (CSUR)**, Volume 24 Issue 4

Full text available:  [pdf\(5.20 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#),

Registration is a fundamental task in image processing used to match two or more pictures taken,

example, at different times, from different sensors, or from different viewpoints. Virtually all large systems which evaluate images require the registration of images, or a closely related operation, as an intermediate step. Specific examples of systems where image registration is a significant component include matching a target with a real-time image of a scene for target recognition, motion ...

**Keywords:** image registration, image warping, rectification, template matching

#### 10 A survey of methods for recovering quadrics in triangle meshes

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#### 11 Multi Relational Data Mining (MRDM): Multi-relational data mining: an introduction

Sašo Džeroski

July 2003 **ACM SIGKDD Explorations Newsletter**, Volume 5 Issue 1

Full text available:  pdf(1.71 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Data mining algorithms look for patterns in data. While most existing data mining approaches look for patterns in a single data table, multi-relational data mining (MRDM) approaches look for patterns that involve multiple tables (relations) from a relational database. In recent years, the most common types of patterns and approaches considered in data mining have been extended to the multi-relational domain, and MRDM now encompasses multi-relational (MR) association rule discovery, MR decision tree ...

**Keywords:** inductive logic programming, multi-relational data mining, relational association rules, relational data mining, relational decision trees, relational distance-based methods

#### 12 Extracting predicates from mining models for efficient query evaluation

Surajit Chaudhuri, Vivek Narasayya, Sunita Sarawagi

September 2004 **ACM Transactions on Database Systems (TODS)**, Volume 29 Issue 3

Full text available:  pdf(698.37 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Modern relational database systems are beginning to support ad hoc queries on mining models. In this article, we explore novel techniques for optimizing queries that contain predicates on the results of the application of mining models to relational data. For such queries, we use the internal structure of the mining model to automatically derive traditional database predicates. We present algorithms for deriving such predicates for a large class of popular discrete mining models: decision trees, naive Bayes ...


**Keywords:** Complex predicate optimization, simpler rules from complex predictive functions

#### 13 Efficient reasoning

Russell Greiner, Christian Darken, N. Iwan Santoso

March 2001 **ACM Computing Surveys (CSUR)**, Volume 33 Issue 1



Full text available:  [pdf\(445.41 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#),


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Jonathan E. Cook, Alexander L. Wolf

July 1998 **ACM Transactions on Software Engineering and Methodology (TOSEM)**, Volume 7 I:

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## 18 Query evaluation techniques for large databases

Goetz Graefe

June 1993 **ACM Computing Surveys (CSUR)**, Volume 25 Issue 2

Full text available:  [pdf\(9.37 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#),

Database management systems will continue to manage large data volumes. Thus, efficient algorithms for accessing and manipulating large sets and sequences will be required to provide acceptable performance. The advent of object-oriented and extensible database systems will not solve this problem. On the contrary, modern data models exacerbate the problem: In order to manipulate large sets of complex objects as efficiently as today's database systems manipulate simple records, query-processor

**Keywords:** complex query evaluation plans, dynamic query evaluation plans, extensible database systems, iterators, object-oriented database systems, operator model of parallelization, parallel algorithms, relational database systems, set-matching algorithms, sort-hash duality

## 19 On randomization in sequential and distributed algorithms

Rajiv Gupta, Scott A. Smolka, Shaji Bhaskar

March 1994 **ACM Computing Surveys (CSUR)**, Volume 26 Issue 1

Full text available:  [pdf\(8.01 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Probabilistic, or randomized, algorithms are fast becoming as commonplace as conventional deterministic algorithms. This survey presents five techniques that have been widely used in the design of randomized algorithms. These techniques are illustrated using 12 randomized algorithms—both sequential and distributed—that span a wide range of applications, including: primality testing (a classical problem in number theory), interactive probabilistic proofs ...

**Keywords:** Byzantine agreement, CSP, analysis of algorithms, computational complexity, dining philosophers problem, distributed algorithms, graph isomorphism, hashing, interactive probabilistic systems, leader election, message routing, nearest-neighbors problem, perfect hashing, primality testing, probabilistic techniques, randomized or probabilistic algorithms, randomized quicksort, sequential algorithms, transitive tournaments, universal hashing

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Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#),

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